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Musculoskeletal disorders among surgeons working in several hospitals of Tehran, Iran (2015)

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Abstract

Background: Work related musculoskeletal disorders (WRMSDs) have been described as one of the main health problems among healthcare workers. Adverse symptoms and disorders of the musculoskeletal system represent an important cause of occupational morbidity for employees around the world.
Materials and Methods: The present study was performed with the aim to identify and characterize musculoskeletal symptoms in a sample including oral and maxillofacial surgeons In Tehran, Capital city of Iran. A cross-sectional identity self-reported Nordic Musculoskeletal Questionnaire (NMQ) was sent to 45 oral and maxillofacial surgeons. Study population completed the Standardized Nordic questionnaire.
Results: Data were analyzed using descriptive statistics in the Statistical Package for the Social Science (SPSS) software. Of the study sample (n = 40), 63.0% and 37.0% of the participants were men and women, respectively. Musculoskeletal symptoms in the lower back with 56.8% were reported to be the most incident symptom, followed by the neck, upper back, and shoulders with a rate of 84.6%, 44.1%, and 37.4%, respectively. The most common symptoms were stiffness in the neck, pain in the lower back, numbness in the wrist/hand, weakness in the wrist/hand, and contusion in the shoulder as 84.0 %, 64.3%, 18.5%, 29.0%, and 42.0%, respectively. As the weight of most of the participants was in the normal range, body mass index (BMI) was not associated with musculoskeletal disorders (MSDs).
Conclusions: This study showed a high incidence of self-reported musculoskeletal symptoms in some body regions among Iranian oral and maxillofacial surgeons. This indicated the need for developing occupational health programs for managing MSDs among surgeons.

Keywords: Ergonomics, Musculoskeletal Disorders, Oral and Maxillofacial Surgeons.

Introduction

Musculoskeletal disorders (MSDs) are a group of disorders confined to muscles, joints, tendons, ligaments, nerves, and bones, sometimes including the localized blood circulation system, the origin or aggravation of which is mainly due to the circumstances of professional activity and effects of working conditions on the injured organs (1). In the medical community, surgeons are at a particularly high risk for developing work-related musculoskeletal disorders (WMSDs) as many of the procedures performed by them may require ergonomically challenging positions for extended periods of time (2). According to global statistics, it has been estimated that 2 million individuals die annually due to work-related injuries or illnesses, while there are 160 million new cases of work-

related illnesses each year (3). The costs of occupational MSDs is important not only for employees, but also the employers and societies (4). According to the literature, the most common WMSDs among clinical workers are lower back pain, with a 1-year incidence rate of 30-62 percent (5). Choobineh et al. evaluated the association between psychosocial factors and MSDs among Iranian nurses in 2 different studies and found that perceived physical demands were significantly associated with MSDs (6). Studies on hospital workers have mainly been focused on nurses (7) and very few studies have examined musculoskeletal symptoms among physicians in various specialties. Surgeons are no exception to this rule and represent a profession with an increased risk of developing musculoskeletal pain (8). Recent studies have documented that surgeons performing surgery experience musculoskeletal pain (9). Although the high incidence of musculoskeletal symptoms among otolaryngology residents is troublesome, the presence of these symptoms is not necessarily unexpected (2). In 2003, Babar-Craig et al. conducted an investigation to determine the incidence of musculoskeletal pain among 325 otolaryngology consultants (mean age = 47) in the UK. The results of this study showed that 24.0%, 19.0%, and 29.0% of the consultants reported neck pain, back pain, and both neck and back pain, respectively for an overall incidence of 72.0% (10). More than 50.0% of these oral and maxillofacial surgeons attributed their symptoms directly to their job as surgeons. More recently, Rimmer et al. Distributed a survey to members of the European Rhinologic Society (ERS) and found that nearly 80.0% of endoscopic surgeons experienced physical pain or discomfort (11). Liberman et al. (4) conducted a study among more than 600 colorectal surgeons who performed colonoscopy regularly and reported a high incidence rate of injuries in the hands or fingers, followed by the neck, and back among 257, 65, and 52 of the participants, respectively. Over 80.0% of plastic surgeons reported at least 1 musculoskeletal injury including muscle strain, neck pain, shoulder arthritis, and carpal tunnel syndrome (CTS) (12). Nearly 80.0% of laparoscopic and thoracoscopic surgeons also complained of discomfort in the neck, shoulders, and back (13). A recent examination on British rhinologists revealed that 59.0% of the subjects experienced pain and/or stiffness due to performing functional endoscopic sinus surgery (FESS) (14). Early training is an ideal time to develop knowledge and awareness on proper workplace ergonomics to positively influence a surgeon's future career.

No study to date has investigated musculoskeletal symptoms among oral and maxillofacial surgeons in Iran. Therefore, the present study was performed aiming to examine the work-related musculoskeletal symptoms among the oral and maxillofacial surgeons, specialty in the city of Tehran, Iran, and to identify the characteristics of the musculoskeletal problems in relation to physical and psychosocial factors that may be involved in this profession. The results can provide information on the severity of the problem and can be used to develop intervention strategies for this group of surgeons and possibly other specialties as well.

Materials and Methods

Participants: The study examined self-report of musculoskeletal symptoms of surgeons working in oral and maxillofacial surgery (OMFS) departments in various private hospitals in the city of Tehran. In April 2015, the Nordic Musculoskeletal Questionnaire (NMQ) was sent to 40 surgeons working in the OMFS departments in the private sector in the city of Tehran and follow-up phone calls were made to the departments to encourage the surgeons to participate in the study. The self-reported musculoskeletal complaints were collected through the Standardized Nordic questionnaire for musculoskeletal symptoms, which had been translated into Persian (15). All the items of the questionnaire had an acceptable face validity (0.78). In addition, the reliability [0.7 (0.87-1)] of this questionnaire was confirmed in various scientific studies (16, 17). In this study, the names and information of the participants were kept confidential due to ethical issues. Moreover, any aggressive testing was avoided in this study.

Survey design: The assessment contained information on 3 categories. The first part of the NMQ included questions regarding the demographic information like age, gender, marital status, body mass index (BMI), smoking, and years of working experience. The second or symptomatic part of the questionnaire inquired about musculoskeletal symptoms in 9 anatomic regions according to the NMQ (18) including neck, shoulders, elbows, wrists/hands, upper back, lower back, hips/thighs, knees, and ankles/feet (Figure 1). The first question for each body region asked if surgeon experienced any musculoskeletal discomfort in that region within the past year. Survey logic was incorporated so that the survey skipped to the next body region if a surgeon

answered “no symptoms”. If the surgeon reported symptoms, however, he or she was then presented with an additional set of questions regarding severity of symptoms (mild, moderate, or severe), impact of symptoms on daily activities, description of the symptoms (pain, stiffness, weakness, numbness, etc.), whether or not symptoms occurred within the past week, whether or not symptoms ever caused the surgeon to stop operating, whether or not symptoms ever caused the surgeons to miss work, and whether or not the surgeons believed their symptoms were directly caused by their work training as a surgeon.

Statistical analysis: Data were analyzed using the SPSS software (version 21, IBM Corporation, Armonk, NY, USA). Descriptive statistics including the rates, percentages, mean, and standard deviation (SD) were used to describe the demographic and work-related data. MSDs were assumed as the dependent variable. In addition, the demographic characteristics and some of the workplace factors were defined as independent variables. $P < 0.05$ was considered to be significant.

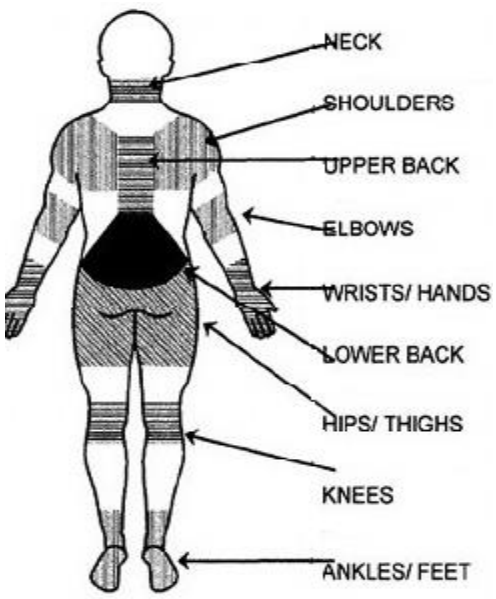

Figure 1: Body sites, Standardized Nordic questionnaire for musculoskeletal symptoms (16)

Results

Of the 45 respondents, 40 completed the questionnaires (response rate 88.9%). 63.0% and 37.0% of the participants were men and women, respectively. The mean ± SD of age, height (cm), and weight (kg) of the participants were 38.54 ± 8.34, 174.00 ± 8.00, and 72.67 ± 12.32, respectively. In addition, the mean ± SD of BMI was 25.20 ± 3.70. In terms of the years of working experience, most of the surgeons as 24 ± 59.80 had between 6 and 10 years of working experience. Table 1 demonstrates the demographic characteristics of the surgeons. Most of the respondents (89.2%) reported suffering from musculoskeletal symptoms in at least 1 area of the body in the past 12 months.

Table 1: Demographic characteristics of the oral and maxillofacial surgeons

Variable		Value
Gender [rate (%)]	**Men**	25 (63.0)
	Women	15 (37.0)
Marital status [rate (%)]	**Single**	11 (27.5)
	Married	29(72.5)
Smoking [rate (%)]	**Yes**	4 (10.0)
	No	36 (90.0)
Years of working experience [rate (%)]	**Under 5 years**	6 (15.2)
	Between 6 and 10 years	24 (59.8)
	Between 11 and 15 years	10 (23.9)
	More than 16 years	1 (2.1)
Age (year)	**Mean ± SD****	38.54 **±** 8.34
BMI* (kg/m^2)	**Mean ± SD**	24.60 **±** 3.70

*** BMI:** Body mass index; ** **SD:** Standard deviation

Musculoskeletal symptoms in the lower back with 56.8% were reported to be the most incident symptom, followed by the sites including neck, upper back, and shoulders with a rate of 84.6%, 44.1%, and 37.4%, respectively during the last year. The results indicated reports of complaints in 4 or more body regions among 59% of the surgeons. Figure 2 depicts the rate of reported MSDs on different sites of the body.

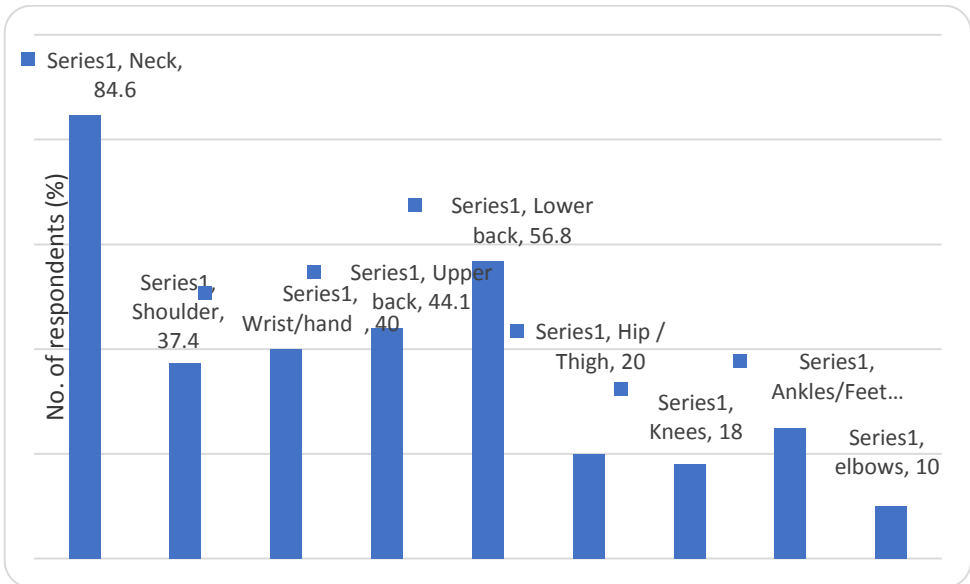

Figure 2: Rate of reported musculoskeletal disorders (MSDs) on body sites

The most common symptoms were stiffness in the neck, pain in the lower back, numbness in the wrist/hand, weakness in the wrist/hand, and contusion in the shoulder as 84.0 %, 64.3%, 18.5%, 29.0%, and 42.0%, respectively. Figure 3 shows the characteristics of symptoms in the oral and maxillofacial surgeons.

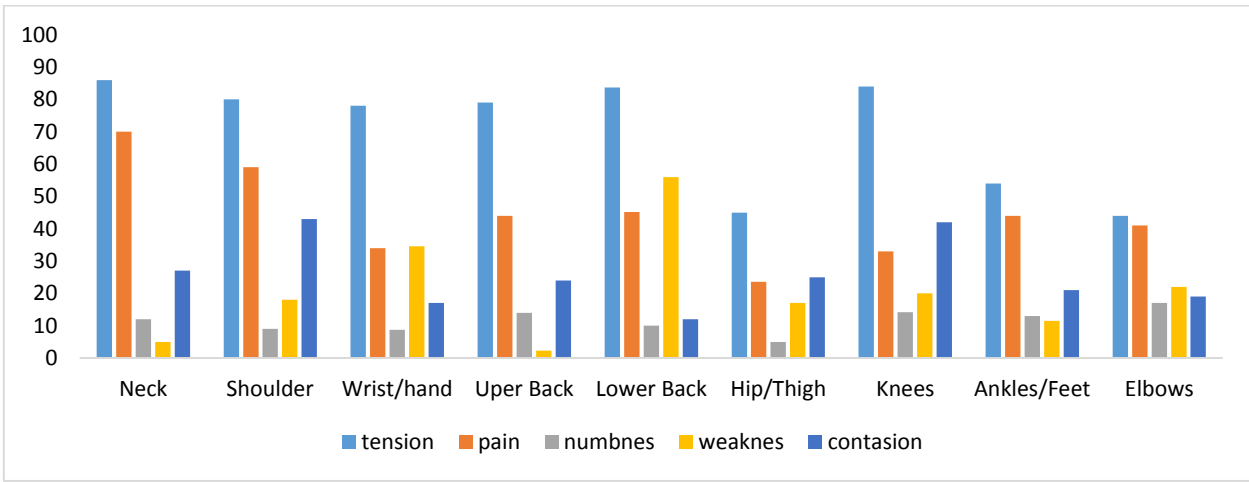

Figure 3: Characteristics of incidence of the musculoskeletal disorder (MSD) symptoms among the oral and maxillofacial surgeons

Discussion

The objective in this study was to explore the incidence and risk factors of work-related MSDs among oral and maxillofacial surgeons in Iran. Identifying risks for work-related injury among physicians and residents can prevent future injury through early intervention and precautionary measures (18). This may be particularly important among oral and maxillofacial surgeons, as previous data has demonstrated a relatively high incidence rate of musculoskeletal symptoms among oral and maxillofacial surgeons. The results of the present study indicated that the majority of the surgeons under study experienced some degree of musculoskeletal symptoms. In addition, it was revealed that almost 75.0% of the subjects experienced MSD in each body region at least once during the past year.

The results of the present study are consistent with previous findings among surgeons. In 2003, Babar-Craig et al. conducted a survey to determine the incidence of musculoskeletal pain among 325 otolaryngology consultants in the UK (mean age = 47). The results of this study showed that 24.0%, 19.0%, and 29.0% of the consultants reported neck pain, back pain, and both neck and back pain, respectively for an overall incidence of 72.0% (10). In a study on surgeons, above 80.0% the subjects reported musculoskeletal symptoms in at least one body area, most commonly the neck, back, and shoulders with a rate of 83.0%, 68.0%, and 58.0%, respectively (7). Recently in 2016, Rimmer et al. conducted an investigation sending a survey to members of the ERS to determine the incidence of musculoskeletal symptoms among endoscopic sinus surgeons (11). The results showed that nearly 80.0% of endoscopic surgeons experienced musculoskeletal symptoms, many of which were directly associated with poor postures during surgery. Previous studies by Hignett et al. (20) have commented that laparoscopic surgery was significantly more stressful than open surgery in terms of physical demands. It has been reported that holding laparoscopic instruments was associated with high rates in hand injuries (7).

In the present study, musculoskeletal symptoms were also found to be common among oral and maxillofacial surgeons. Hence, understanding the characteristics of the symptoms and associated workplace factors are important steps towards finding effective solutions to these problems. The present study is the first to investigate the influence of psychosocial risk factors affecting the surgeons.

The results support the findings of similar previous studies in other countries like the findings of the studies by Wong et al. (2), Szeto et al. (7), and others who suggested that MSDs although the high incidence rate of musculoskeletal symptoms among oral and maxillofacial surgeons is troublesome, their presence is not necessarily unexpected. Previous studies among other surgeons have already demonstrated that surgeons as a group are at a greater risk for WMSDs (21). Multiple risk factors for WMSDs can describe the daily work of a surgeon including concentrated hand or wrist motions, strained body positions, and extended periods of standing (22). Some of the procedures performed by otolaryngologists may also promote maladaptive behaviors increasing the risk for injuries like repetitive motions or craned necks during microscopic procedures (23).

The results also showed that ergonomic risks main for surgeons, including constrained posture, repetitive upper limb movements, forceful exertion, and occupational health factors were the most significant predictors of the work-related musculoskeletal symptoms among oral and maxillofacial surgeons.

As the weight of the majority of the participants in this study was in the normal range, BMI was not associated with MSDs. This is in agreement with the findings of the study by Attarchi et al. (24) from Tehran, Iran. However, Trinkoff et al. (25) reported a significant association between BMI and back/shoulder symptoms. The findings of a systematic review by Leboeuf-Yde also showed a positive association between body weight and low back pain (LBP) only in 32% of studies (26).

The important and first step to decrease occupational injury is to recognize common signs of WMSDs (27). To accomplish this, hospitals should educate staff on proper workplace ergonomics, implement changes reducing known risk factors for WMSDs, and establish an injury reporting process. To prevent MSDs, training has been recommended to reduce surgeon morbidity and ergonomic principles should be part of surgical training.

Conclusion

In this study, a high incidence rate of self-reported musculoskeletal symptoms was observed in some body regions by the NMQ. Further research should be conducted to establish the epidemiology of MSDs among oral and maxillofacial surgeons and support the need to develop occupational prevention and control programs in surgery centers.

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Conflict of interest: None declared.

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